A study is reported of some two thousand consecutive visits to the emergency service of the Yale-New Haven Hospital during a two-week period. The salient characteristics of those using the emergency service were defined. Patterns of medical care were analyzed in relation to urgency of need for emergency treatment and other indexes and factors. Findings modified hypotheses concerning those who use emergency service and their reasons for doing so.

YALE STUDIES IN AMBULATORY MEDICAL CARE

V. DETERMINANTS OF USE OF HOSPITAL EMERGENCY SERVICES

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Introduction

PREVIOUS studies in this and in other medical centers throughout the country have documented the marked change during the past few decades in the volume and nature of hospital emergency services.[1-8] The over-all volume of visits has risen steadily and precipitously, out of proportion to concomitant increases in hospital admissions, clinic visits, or population growth in the hospital areas. A major aspect of this trend has been the growing proportion of visits to the emergency facility for a wide variety of nonurgent conditions. Available evidence suggests that much of the increment of nonurgent usage is due to dependence on the hospital for general medical needs by the indigent "core city" population, and to recourse to the emergency service by self-supporting members of the community who cannot get or do not seek prompt attention from private physicians.[1,6,7]

NOTE: Due to limitations of space, many of the tables and figures in the full research report have been omitted. These are available from the senior author upon request.

After documentation of these utilization trends in the emergency rooms of the Yale-New Haven (formerly Grace-New Haven) Hospital, a system of so-called "medical triage" was instituted in 1963. An initial screening technic, triage is intended to provide brief medical evaluation of all incoming patients, to determine the type and priority of service needed, and to accomplish appropriate referral. This program has been described and evaluated in previous reports.[1,2]

Objectives of this Research

Although the triage program has been successful in reducing congestion in the emergency treatment areas and in accelerating the flow of patient care, in addition to directing many patients to more suitable medical resources, a high proportion of nonurgent cases continues to characterize the emergency service experience. While the previous surveys have suggested possible explanations for this persistent trend, no comparative study has been made of the characteristics of patients according to the urgency of their conditions, nor of the

varying patterns of medical care sought at the time the patient considered his need to be critical. The investigation here reported was designed to provide such information, using the findings of the earlier studies as a basis for formulating the guiding hypotheses.

Research objectives were to delineate the demographic characteristics of the emergency service patient population, to identify the usual patterns of seeking and receiving emergency medical care, and to assess the major factors affecting the urgency of need for such care.

General Hypotheses

Analysis of available data and operational experience had led to the assumption that three major and a number of subordinate factors could be shown to be responsible for the increasing use of the emergency service for nonurgent conditions. The most important determinants were expected to be low social class status, recent tenure of residence in the hospital service area, and lack of regular relationship with a personal physician. Lesser influences were assumed to be such factors as frequent prior use of the emergency service, daytime visits, self-referrals, central city residence, adult age of patients, and patients' own perception of medical urgency.

In essence, the hypotheses assume that patients in deprived socioeconomic circumstances who depend upon the nearby hospital for general medical aid are the most likely to use the emergency service for nonurgent conditions.

Methods

Setting

The Yale-New Haven Hospital, a 727-bed general hospital, is closely affiliated with the Yale University School of Medicine and related facilities in a complex known as the Yale-New Haven Medical Center. An annual total of some 100,000 visits are made to its outpatient clinics and about 50,000 additional visits to the emergency service. One other nearby community hospital, under Catholic auspices, maintains a smaller emergency service, with a total of some 24,000 annual visits. The major service area is that of the city of New Haven, plus a ring of contiguous industrial and residential suburbs and the nearby smaller towns—an essentially urbanized area of some 250,000 population.

The emergency unit is fully equipped and staffed for continuous operation. Incoming patients are registered, "triaged," and treated without prior financial screening; charges are rendered for all services, with both direct collection and mailed billings. The assigned resident house staff is supported by consultants and on-call panels of both university and community physicians.

Research Design

Sampling Plan—The study sample comprised 2,028 visits to the emergency service during the two-week period from July 9 through July 22, 1964. This total study population represents consecutive registrations during this period, except for those revisits for cast checks, drug dosage adjustment, and test readings, as requested by the emergency service physician. Repeat visits by one person were recorded separately. Data were obtained for each patient from carbon copies of the standard Emergency Service Record Form, to which a special notation of the physician's urgency rating was added during the time of this study. For the over-all sample, data were recorded in the following categories: day of week, time of day, address, age, sex, religion, marital status, color or nationality, previous use of the emergency service, referral source, and special urgency rating.

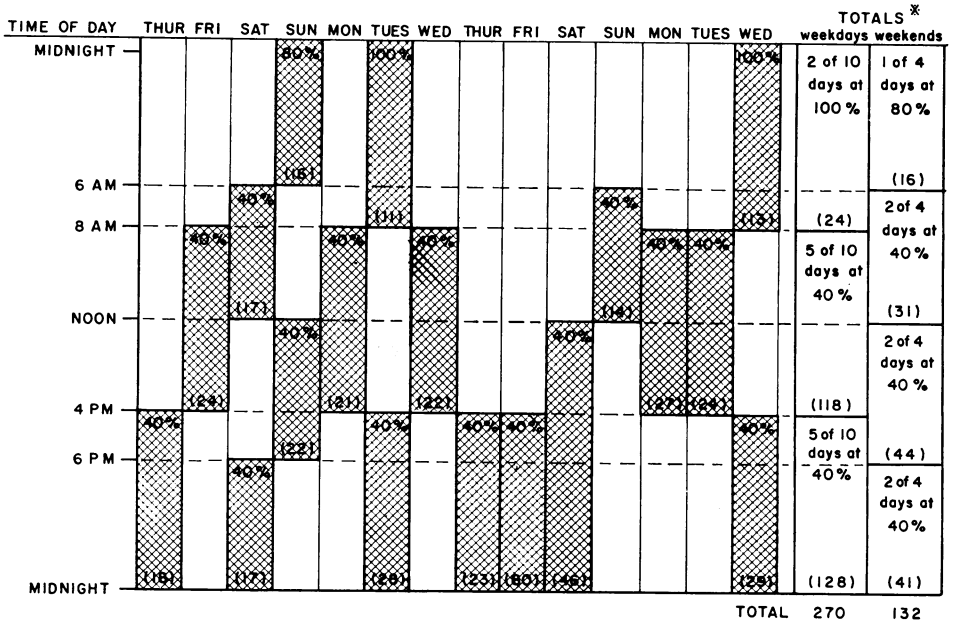
In addition, a 20 per cent subsample of these 2,028 patients was drawn as the basis for collection of interview data

on socioeconomic status and medical care patterns. A carefully plotted interviewing schedule was devised to produce the one-fifth sample of the total visits over the two-week period, allowing for a safe margin of interviews in excess of the calculated minimum necessary for the analysis. The interviewing schedule was divided into randomized blocks of time covering all hours and all days during the two-week period, with the ratio of interviewed to all incoming patients varying from 1:5 to 4:5 according to the previously determined admission rates for each block of time. The rate and process of interviewing were pretested with a random sample of 30 patients and arranged so that there would be little danger of "losing" a patient during the rush of the busy hours. This system of calculated sampling rates within randomized blocks of time is shown in Figure 1.

The sampling method resulted in 402 interviews; almost exactly 20 per cent of the study population. The distribution of this subsample was compared to that of the study population with respect to various population characteristics, to determine whether the selected subsample was truly a representative one. Appropriate statistical comparisons revealed that the subsample of 402 did not differ significantly from the study population of 2,028 with respect to distributions by age, sex, marital status, race, religion, number of previous admissions, time of visit, and medical urgency rating. It was concluded that the subsample was adequately representative of the total study population for the purposes of this investigation.

Interview Technic—Two interviewers (graduate students in medicine and sociology) conducted all data collection from the subsample population. Patients

Figure 1—Sampling schedule with per cent and number interviewed by time of day and day of week, July 9-22, 1964.



* A 20% sample was drawn for each block of time.

were selected according to the sample plan from the registrar's daily ledger. In most cases, the interview-questionnaire was administered in an office adjacent to the registration area at a convenient time during the emergency service visit. Urgent and complex cases were handled according to the advice of the attending physician, occasionally after hospital admission or by follow-up home visits and telephone calls. The routine interview lasted about five minutes. Parents or attendants were interviewed when the patient was unable to provide the information. Transients and patients dead on arrival made up the very small number of cases in which little or no information was available.

Interview Data—Supplementing the information derived from the regular Emergency Service Record Form for the entire study population, the interview-questionnaires provided data from the subsample on duration of residence, usual source of medical care, process of obtaining emergency care in relation to the current visit, socioeconomic status, and duration of the presenting medical problem.

Limitations and problems inherent in this sampling method are discussed in a later section of this report.

Evaluation of Urgency

Urgency ratings in the three categories of "emergent," "urgent," and "nonurgent" were made for each patient during the study period by the resident physician assigned to the case. Two triage officers made over half of all evaluations; the remainder were accomplished by the residents who provided the definitive treatment. In the small number of cases where such ratings were not recorded, the evaluation was made on the basis of the medical record by the physician member of the research team. Diligent efforts were made to standardize the rating procedures on the part of all participating physicians. The classifications were defined as follows:

Emergent: Condition requires immediate medical attention; time delay is harmful to pation; disorder is acute and potentially threatening to life or function.

Urgent: Condition requires medical attention within the period of a few hours, there is possible danger to the patient if medically unattended; disorder is acute but not necessarily severe.

Nonurgent: Condition does not require the resources of an emergency service; referral for routine medical care may or may not be needed; disorder is nonacute or minor in severity.

Data Processing

Recorded information was coded and transferred onto machine punched cards in standard manner, with all data regarding one visit represented on a single card and separate cards maintained for the interviewed and noninterviewed samples. Tables showing percentage distribution were derived for descriptive purposes. These were contrasted with available and comparable 1960* census data for the New Haven area, based in most cases on the Standardized Metropolitan Statistical Area for New Haven County.[9] Census tracts in outlying areas and age groups under 15 years were excluded from the study population when necessary for appropriate geographic or adult group comparisons. In such instances the percentage distribution within the original sample was not significantly altered with respect to the data being compared. Contingency tables were constructed for analytic purposes. The chi-square method was employed for tests of statistical association, with a probability of less than 0.10 accepted as significant since previous research made it possible to anticipate the "direction" of the associations. Yates's correction for continuity was applied when the smallest expected value in a fourfold contingency table was less

* At the time of data processing, more recent census information was not available.

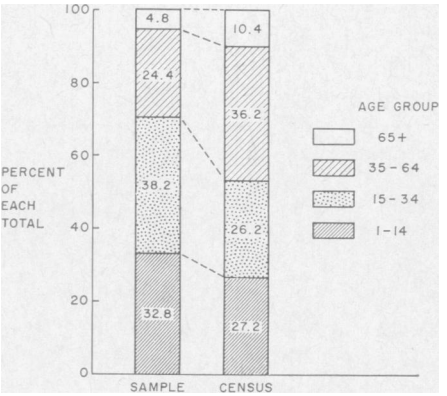


Figure 2—Percentage distribution by age group, study population and New Haven area.

than 100. Graphic figures and census tract maps were prepared when appropriate. The major factors affecting the urgency rating were subjected to multivariate analysis according to the method reported by Cochran and Hopkins.[10] The Hollingshead Two-Factor Index[11] was used to measure "social position."

Findings

Description of the Study Population

Demographic characteristics of the 2,028 emergency service patients were compared with similar data relating to the general population of the service area.

Age Composition—The emergency service patients were significantly younger than the full population at risk, with higher proportions in all age brackets below 35 years (Figure 2). Over half of the sample were under 25 years of age; only 5 per cent were over 65 years. This contrasts with approximately 30 per cent under 25 years and 10 per cent over 65 years for the census population.

Sex Distribution—The study group contained 58 per cent of males in comparison with 49 per cent reported for the New Haven census.

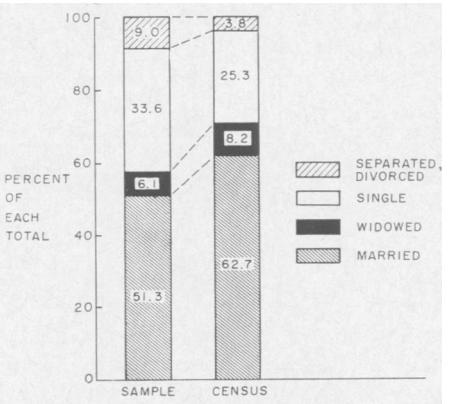
Marital Status—The adult patients in the sample showed higher proportions in the single, separated, and divorced categories, in contrast to the relatively greater number of married and widowed persons in the census population (Figure 3).

Minority Group Status—Because of the special social and medical care problems of the Negro and other minority groups in the New Haven community, their relative proportions in the study and census population were compared. The 34 per cent of the total emergency service sample represented by the nonwhites contrasted with the 9 per cent reported in the 1960 New Haven census.

Location of Residence—When the percentage of emergency service patients to total population is compared by census tract and illustrated on a map of the New Haven area (Figure 4), the higher proportions in the inner city areas adjacent to the hospital are readily demonstrated.

Duration of Residence in City—Additional characteristics of the patient population were identified from the inter-

Figure 3—Percentage distribution by marital status, study population and New Haven area.*



* Includes all persons 14 years and over.

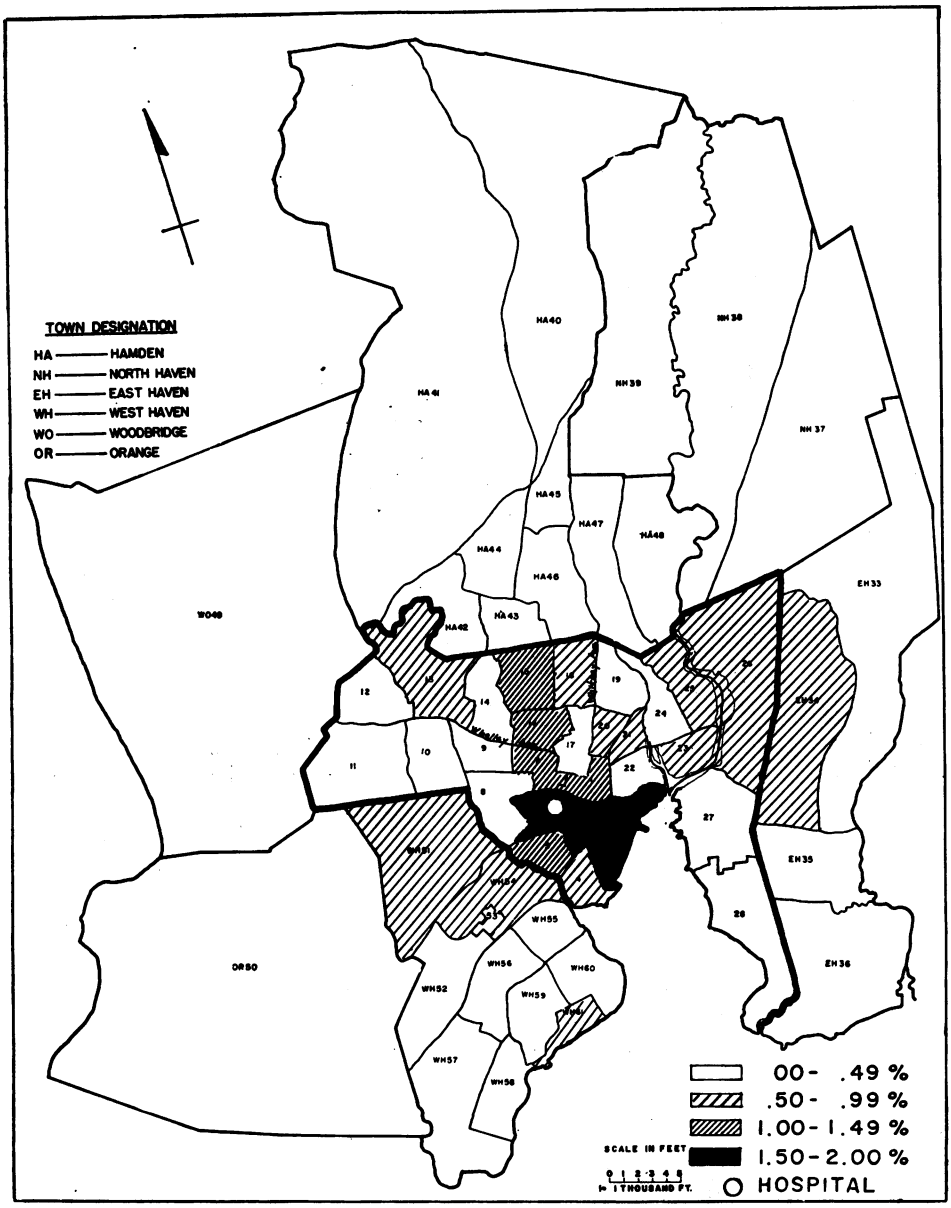


Figure 4—Per cent of emergency service patients to total population by census tract, study population and New Haven area.

views with the subsample of 402 emergency service visitors. Two-thirds (66 per cent) of this patient group had lived in New Haven for more than ten years and 77 per cent over five years. Only 6 per cent were in residence in the city less than one year. No significant differences were noted in comparison with the New Haven area population when tenure above and below five years was compared.

Length of Time at Current Address—

Table 1—Occupation of head of family; interviewed subsample

Occupation	Number	Per cent
Total	402	100.0
Higher executives, proprietors of large concerns, major professionals	17	4.2
Business managers, proprietors of medium-sized businesses, lesser professionals	23	5.7
Administrative personnel, owners of small independent businesses, minor professionals	33	8.2
Clerical and sales workers, technicians, owners of little businesses	78	19.4
Skilled manual employees	90	22.4
Machine operators, semiskilled employees	51	12.7
Unskilled employees	110	27.4

Some 15 per cent of the subsample of patients had been at their current address less than one-half year and 47 per cent were so located for fewer than two years. Again, the census data were similar when tenure above and below two years was compared.

Employment—The rate of unemployment among heads of households represented in the interviewed subsample (22 per cent) was five times as high as that reported for adults in the general population (4 per cent). A more detailed breakdown of the subsample indicated that 14 per cent were recorded as chronically unemployed, when those temporarily out of work or retired were separated in the calculation.

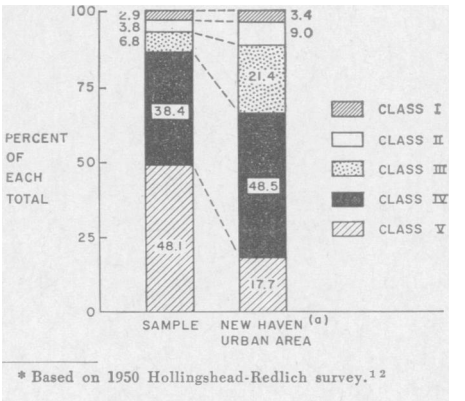
Occupation — The distribution by usual or current occupation of the head of the family of patients in the emergency service subsample showed that 18 per cent were in the professional-managerial groups; about 42 per cent in technical and skilled worker categories; and approximately 40 per cent in semi-skilled and unskilled employee groupings (Table 1). No directly comparable census data were available.

Educational Level—The distribution by amount of schooling completed by the head of family of patients in the subsample was surprisingly similar to that for the area as a whole. About 35 per cent of the family heads in the subsample had less than eight years of schooling; 44 per cent finished high school; almost 9 per cent completed four years of college.

Social Class Status—The two-factor index used to determine social position was based on occupation and education of the *head of the family*, weighted in a ratio of 7:4.[11] This was related to the only available comparable data, the New Haven study in 1950 by Hollingshead and Redlich[12] (Figure 5). The patient subsample had relatively fewer in classes II, III, and IV, with more than twice the proportion in the lowest class V.

Family Income—Data on total family income (not restricted to head of household) were collected as an independent measure of socioeconomic status. Over half of the subsample patients were in families with total incomes of less than $5,000. In comparison with the census population, the patient subsample showed

Figure 5—Percentage distribution by social class, interviewed subsample and New Haven area.



* Based on 1950 Hollingshead-Redlich survey.[12]

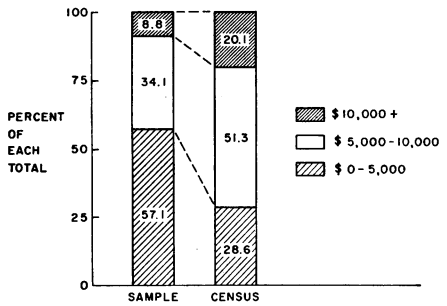


Figure 6—Percentage distribution by family income, interviewed subsample and New Haven area.

almost twice the proportion below this level (Figure 6).

Summary of Demographic and Social Characteristics—In relation to comparable data from the New Haven area, the emergency service study population had the following major characteristics:

1. More children and young adults
2. More males
3. More nonmarried
4. More nonwhite
5. More "inner city" residents
6. Similar level of education
7. Similar tenure of residence
8. Lower socioeconomic status.

Patterns of Medical Care

As the necessary backdrop to the analysis of utilization of the emergency service, data were collected from the subsample of 402 interviewed patients concerning their usual patterns of seeking and receiving medical attention. Information was recorded on usual source of care, regular relationship with a private physician, and previous use of the hospital emergency facility.

Usual Source of Medical Care—When asked, "Where do you usually go when you need medical help?," 37 per cent of patients referred to private physicians, 13 per cent to hospital clinics, 25 per cent named the emergency service itself as the usual first resource, and others responded variously as indicated in Table 2. Of the total subsample, about half indicated the lack of any regular source of medical care.

Patient-Physician Relationship—In response to the query: "Do you have a regular doctor, one you usually go to?," 51 per cent answered in the affirmative. Apparently, some persons who report such a relationship with a physician do not necessarily call upon him at all times of medical need, and others included welfare and clinic physicians in this category.

Reasons for Lack of "Regular" Physicians—Those patients reporting no ongoing medical relationship were asked to explain this lack. Among the 196 persons responding to this question, almost half referred to their use of hospital clinics, while smaller numbers of patients reported such factors as lack of need, cost barriers, and so on (Table 3).

Frequency of Use of the Emergency Service—Sixty-eight per cent of the total study population of 2,028 had visited the emergency service at some previous time. The number of such visits during the preceding 12 months was asked of the interviewed subsample. Some 46 per cent reported at least one visit during the past year, while 16 per cent indicated three or more visits.

Use of the Emergency Service for Current Visit

Against this background of information on usual source of medical care, in-

Table 2—Patients' usual source of medical care; interviewed subsample

Usual Source	Number	Per cent
Total	402	100.0
Private physician	147	36.6
Emergency service	99	24.6
No consistent pattern	62	15.4
Hospital clinic	53	13.2
No previous medical care	18	4.5
Occupational health service	15	3.7
Student health service	4	1.0
Unspecified	4	1.0

Table 3—Patients' main reason for not having a private physician; interviewed subsample

Main Reason	Number	Per cent
Total responding	196*	100.0
Uses clinic	88	44.9
"Doesn't need one"	41	20.9
Cost	39	19.9
"Doesn't know one"	15	7.6
Miscellaneous reasons	13	6.7

* Based on 196 responses from the 225 patients reporting no regular private physician.

vestigation was made of the actual pattern of behavior in relation to the current emergency service visit. Interview data were collected from the 402 interviewed patients with respect to the first effort to obtain medical care for the current disorder, the specific source of referral to the hospital emergency service, and the patient's reason for direct self-referral.

Kind of Care Sought—Seventy per cent of the subsample of 402 patients came or were brought by others directly to the emergency service without first applying for other kinds of help. Some 20 per cent initially sought a private physician, while most of the remainder looked first to other institutional resources (Table 4).

Type of Referral—Of the 282 patients who had no medical help prior to the emergency service visit, 220 came to the emergency service directly on their own and the rest were referred or brought in by others (i.e., friends, employers). When referral sources for the entire subsample were investigated, the over-all proportion of self-referrals was 55 per cent, with the other specific sources distributed as shown in Table 5. Referrals from professional sources made up 21 per cent of the total, responsible lay groups (police, employers, community agencies) accounted for 13 per cent, while friends and relatives made up the remainder.

Patients' Reasons for Visits—Those patients who were self-referred were queried about their reasons for coming to the emergency service for this visit (Table 6). One-third indicated that the decision represented their own impression of the best way to handle the medical problem. Some 27 per cent mentioned their lack of a regular relationship with a private physician and another 20 per cent responded in terms of the unavailability of their private physician. Only one patient referred to any consideration of cost or insurance coverage, although cost may well have been a factor for those patients having no private physicians. In general, the distribution of reasons is similar to that reported by a much larger patient sample in a previous study at this hospital.[1]

Relation of Usual and Current Medical Care Activities—Data on usual source of medical care were analyzed in relation to the way in which the patient sought help for the current disorder. The expectation was that those who alleged to have a regular physician would initially seek his assistance or advice at the time of medical need. The data indicate, however, that only 41 per cent of patients who claimed to have a regular physician sought his help initially. This is a significantly higher proportion than

Table 4—Kind of medical care sought before coming to the emergency service; interviewed subsample

Medical Care Sought	Number	Per cent
Total	402	100.0
None	282	70.2
Private physician	81	20.1
Clinic, VA Hospital	19	4.7
Other*	19	4.7
Unspecified	1	0.3

* Includes mainly student health service and private pharmacist.

Table 5—Source of referral to emergency service; interviewed subsample

Referral Source	Number	Per cent
Total	402	100.0
Self	220	54.7
Private physician	55	13.7
Friend or relative	42	10.5
Police	32	7.9
Employer	17	4.2
Hospital clinic	13	3.2
Community agency	5	1.3
Other*	16	4.0
Unspecified	2	0.5

* Includes mainly student health service and private pharmacist.

was found for those in the other "usual source" categories, but is in itself unexpectedly low (Table 7).

Summary of Medical Care Patterns—Overall, the interview data suggest that at least one-half of the patients seen in the hospital emergency facility had no constant "outside" medical relationships, and one-quarter considered the emergency service itself as the usual source of care. Economic factors were implicit among the reasons for not having a "regular" private physician. On the occasion of the actual emergency service visit, over two-thirds of the patients obtained hospital emergency care directly without seeking other prior help, and over half were self-referred. Difficulties in obtaining private medical care were prominent among the reasons for direct self-referral. While those who claimed to have a regular doctor came directly to the emergency room less frequently than the others, a majority of even this group failed to seek private care initially.

Analysis of Urgency Evaluation

A major focus of the study was the increasing tendency of patients to use the emergency service for nonurgent medical problems. In the effort to explain the reasons for this trend, urgency ratings made by the resident physician in the emergency service were examined with respect to each of the demographic, socioeconomic and medical care factors summarized above.*

Evaluation of Urgency—Only 126 patients (6 per cent) in the total study population of 2,028 were classified by the resident staff as "emergent," according to the definition indicated above. About 36 per cent were rated as "urgent," and 56 per cent recorded as "nonurgent." An urgency evaluation could not be determined for some 2 per cent of the study population. (The distribution of urgency ratings for the interviewed subsample was essentially similar, and is used in the detailed analysis of factors associated with urgency.)

No comparable measure was available of urgency as perceived by the patient, but data were collected with respect to the related factor of duration of the current disorder—an index considered more reliable when asked of lay

* In the contingency tables constructed for this analysis, the small number of "emergent" ratings were grouped together with those in the "urgent" category. Both of these groups were considered appropriate for emergency service, in contrast to the "nonurgent" patients.

Table 6—Patients' main reason for self-referral to the emergency service; interviewed subsample

Main Reason	Number	Per cent of Applicable
Total self-referral	220*	100.0
Patients' choice	73	33.2
Has no private physician	61	27.7
Private physician unavailable	45	20.5
Proper hospital unit closed	23	10.5
Administrative†	13	5.9
Convenient location	4	1.7
Cost, coverage‡	1	0.5

* Excludes 180 patients referred by others and two unspecified.
† Visit requested by hospital or local agency.
‡ Expectation of low fees or of insurance benefits.

respondents. On this basis, 69 per cent of patients stated that the onset of the current medical problem had been within one day; 23 per cent indicated the onset to have been within one week; and 8 per cent reported durations of longer than one week. While the residents' urgency ratings are not directly comparable with the patients' duration reports, the contrast in professional and lay interpretation is striking (Figure 7).

A surprising finding was the lack of significant differences in medical urgency ratings among patients reporting various times of onset of the current disorder. Even among those who reported the duration of the disorder to have been less than one day, almost 60 per cent were medically rated as nonurgent.

Demographic Factors Affecting Urgency Rating—Significantly less use of the emergency station for nonurgent conditions was made by the youngest and oldest groups in the total study population (Figure 8; $p<0.001$). Yet, even among those patients aged four years or younger, almost half received nonurgent ratings.

No significant differences in urgency ratings were noted with respect to sex or religion. There was, however, a lower rate of "nonurgency" among white as compared with Negro patients in the full study population (Figure 8; $p<0.02$).

Residence Factors Affecting Urgency Rating—Analysis of data relating to tenure of residence made it possible to discriminate between length of time in the New Haven area and length of time at the current residential address. No significant differences in urgency ratings were obtained in relation to years of residence in New Haven, while sharp differences were found when years at current address were considered. In this latter case, the proportion of nonurgent cases declined as the years of residential tenure increased (Figure 9; $p<0.10$).

The proportion of patients with nonurgent conditions in each census tract of the New Haven area does reflect some important variations. The distribution by census tract map suggests a greater use of the emergency service for nonurgent conditions by those living in the central districts of the city—although the pattern is somewhat variable (Figure 9).

Socioeconomic Factors Affecting Ur-

Table 7—Usual source of medical care by kind of medical help initially sought; interviewed subsample

Help Sought	Usual Source: Private Physician	Emergency Service; No Previous Medical Care	Clinic	No Consistent Pattern	Total
None	77 (52.4)*	99 (84.6)	54 (75.0)	50 (80.6)	280
Physicians	60 (40.8)	6 (5.1)	5 (6.9)	9 (14.6)	80
Clinic	10 (6.8)	12 (10.3)	13 (18.1)	3 (4.8)	38
Total	147 (100.0)	117 (100.0)	72 (100.0)	62 (100.0)	398

* Numbers in parentheses indicate percentage of column total.

$X^2_{6df} = 67.63$, $p<0.01$.

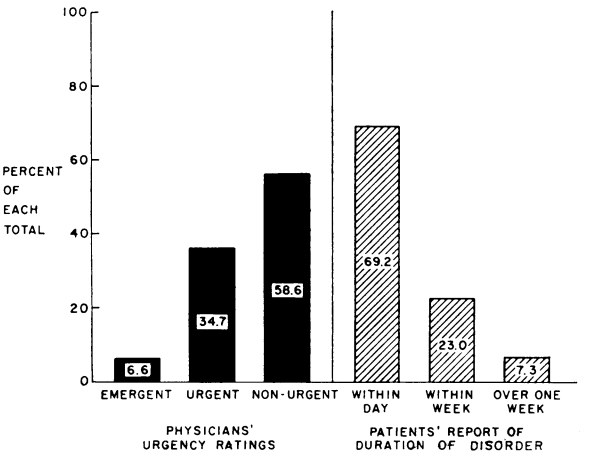


Figure 7—Comparison of physicians' urgency ratings and patients' reports of duration of disorder; interviewed subsample.

gency Rating—No significant differences were found in percentage of nonurgency among the various social class groupings. Actually, 62 per cent of patients in the three highest social classes (I-III) were rated as nonurgent, in contrast to the 57 and 60 per cent values recorded for the two lowest classes (IV and V).

Separate analyses were made of the data on education and occupation, but associations with urgency ratings were equally weak. Contingency tables were also constructed using family income

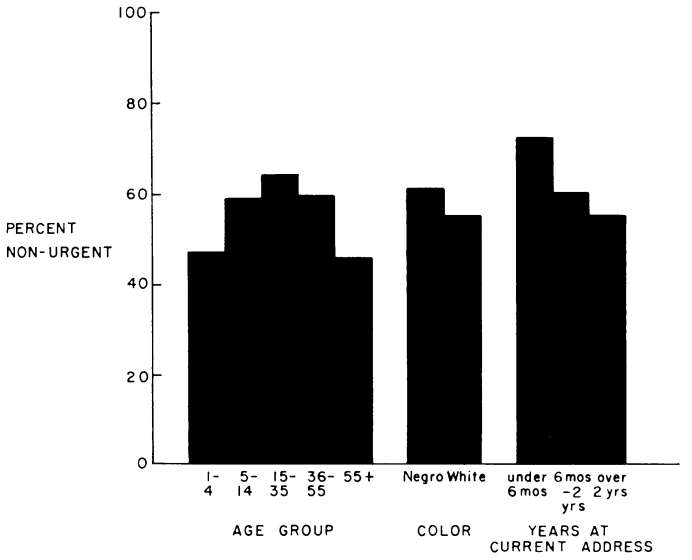


Figure 8—Percentage of nonurgent patients by age, color, and years at current address; interviewed subsample.

distribution data—again with unimpressive results. Only when all incomes were grouped into two categories, above and below $5,000 per year, was even borderline association with urgency ratings obtained. But even in the highest of income groups (above $10,000 per year), 59 per cent of patients were rated as nonurgent.

Patterns of Usual Medical Care in

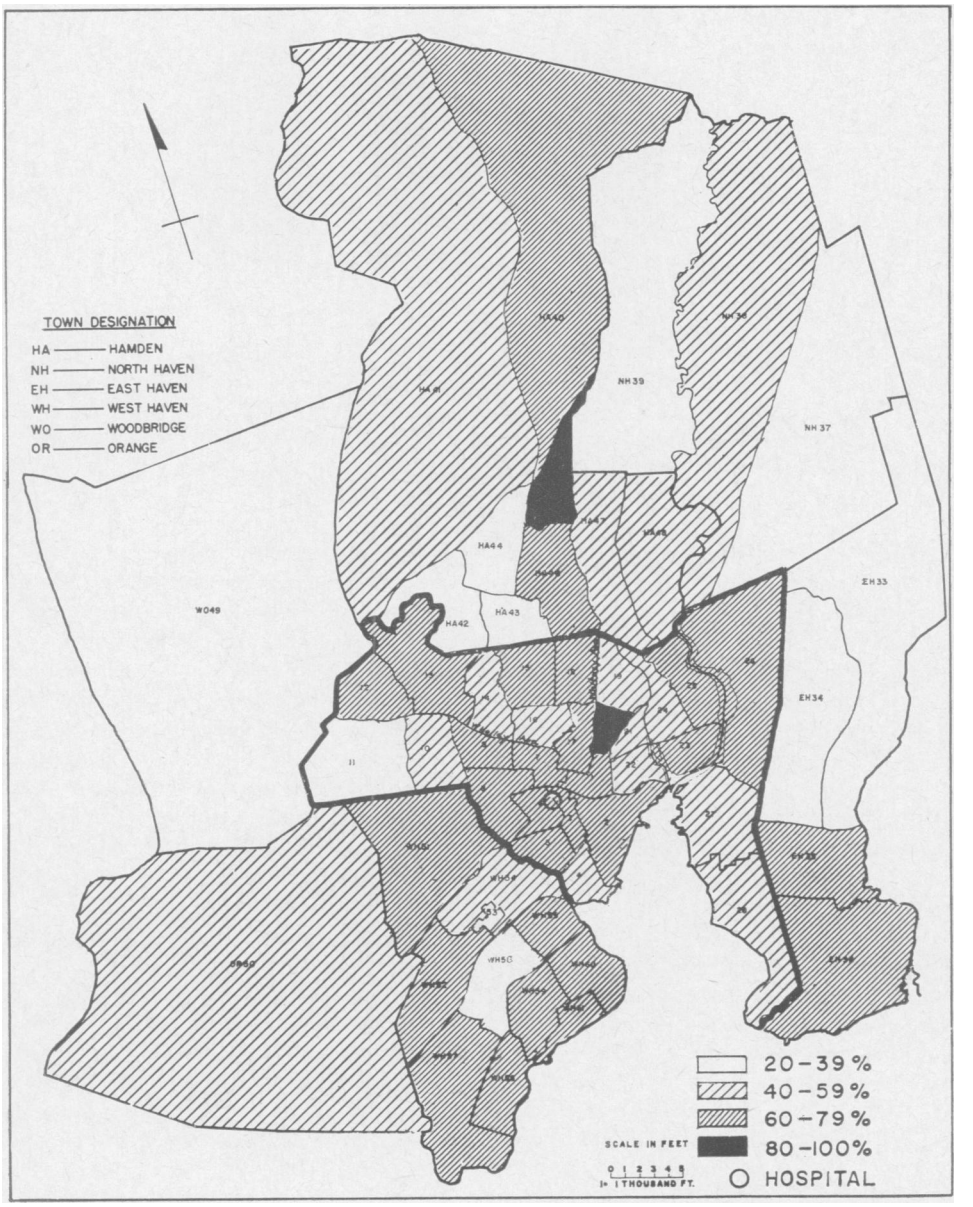


Figure 9—Per cent of nonurgent study population patients by census tract in New Haven area.

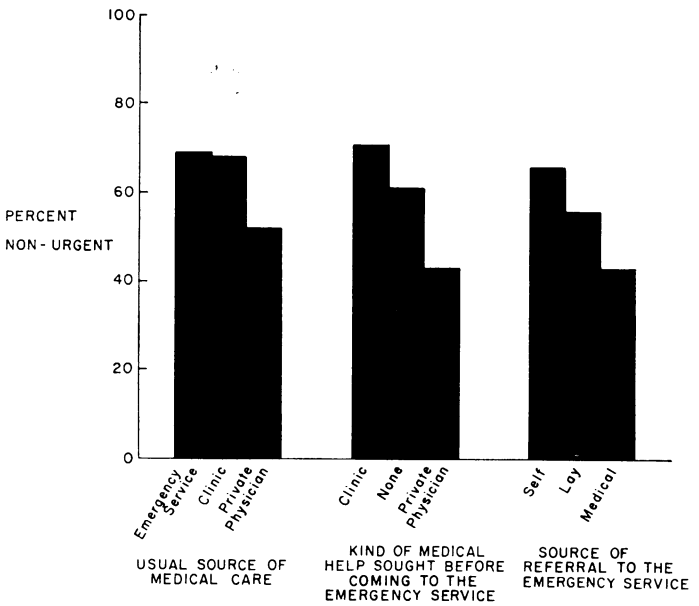


Figure 10—Percentage of nonurgent patients by usual and current patterns of medical care; interviewed subsample.

Relation to Urgency Rating—Urgency ratings were compared among patients having different patterns of obtaining medical care. The proportion of nonurgent cases was significantly higher among those who generally rely upon hospital outpatient facilities than among those with regular private physicians (Figure 10; $p<0.01$).

The number of previous visits to the emergency facility was not significantly related to urgency rating, and differences of only borderline significance were found when those with no visits during the preceding year were compared with patients who had visited one or more times. (The latter group tended to show slightly higher rates of nonurgent usage.)

Current Use of Emergency Service in Relation to Urgency Rating—It was anticipated that patients who were self- or lay-referred would tend to have relatively high nonurgency ratings. Significant differences in proportion of nonurgent ratings were indeed found when those who originally sought the help of a private physician were compared with other groups (Figure 10; $p<0.01$).

When the referral source was medical (physician, hospital, etc.), the percentage of nonurgent cases was again significantly smaller in comparison with self- and lay-referrals (Figure 10; $p<0.01$). Thus, the kind of medical help initially sought by or for the patient is a major predictive factor in relation to the urgency status.

The influence of timing of visits was less clear-cut. No significant differences were found among the various days of the week. Differences of only borderline significance were found in the proportion of nonurgent cases among patients coming to the emergency service at various times of the day and night; the lowest rate (still 49 per cent!) occurred, as might have been expected, in the 4-8 a.m. period. However, the over-all nonurgency rate during the "regular"

daytime and evening hours from 8 a.m. to 10 p.m. was significantly higher than the rate in the 10 p.m. to 8 a.m. nighttime period.

Multivariate Analysis of Factors Affecting Urgency Rating—In the effort to establish the relative importance of selected factors which were expected to have significant effect upon the urgency rating, the classification procedure for use with multivariate qualitative data[10] was applied to the 360 individuals in the interviewed subsample for whom all items of information were known and could be dichotomized. Patients in this subsample were assigned to one of two categories (urgent or nonurgent) on the basis of five selected qualitative observations on each individual. The items chosen and the division used for each were as follows:

1. Age distribution—ages 14 and under plus ages 55 and over; ages 15-55
2. Relationship with private physician—yes; no
3. Minority group status—white; Negro
4. Tenure of residence—less than two years; two years or more at present address
5. Annual family income—less than $5,000; $5,000 or more.

The multivariate analysis indicated that age was clearly the most influential factor among those selected. The ability to classify correctly an individual into urgent or nonurgent categories was only slightly enhanced when all five items were used, as compared with such predictive ability based upon age distribution alone. The second most important factor was regular relationship with a personal physician. The other three items chosen have lesser predictive value.

Summary of Factors Affecting Urgency Rating—The following are the factors among all those investigated which were found to have significant relationship to the urgency rating of the patient:

1. Age of patient
2. Regular relationship with a personal physician
3. Professional referral to the emergency service
4. Years at current address
5. Minority population group status
6. Location of residence in city area.

Analysis of Medical Care Patterns in Relation to Social Class

A major hypothesis of the study was that patterns of use of the emergency service are strongly influenced by the

Table 8—Social class by usual source of medical care; interviewed subsample

Usual Source	Social Class I-III	IV	V	Total	Per cent IV+V
Private physician	46 (61.3)*	62 (43.1)	38 (21.7)	146	68.5
Emergency service	6 (8.0)	29 (20.0)	64 (36.6)	99	93.9
No consistent pattern					
No previous medical care	14 (18.7)	26 (18.1)	38 (21.7)	78	82.1
Clinic	9 (12.0)	27 (18.8)	35 (20.0)	71	87.3
Total	75 (100.0)	144 (100.0)	175 (100.0)	394	80.9

* Numbers in parentheses indicate percentage of column total.
$X^2_{4df} = 46.32$, $p < 0.01$.

Table 9—Social class by kind of medical help sought before coming to the emergency service; interviewed subsample

Medical Help Sought	Social Class				
	I-III	IV	V	Total	Per cent IV+V
None	45 (60.6)*	107 (73.8)	128 (72.7)	280	83.9
Private physician	24 (32.0)	25 (17.2)	30 (17.0)	79	69.6
Clinic	6 (8.0)	13 (9.0)	18 (10.3)	37	83.8
Total	75 (100.0)	145 (100.0)	176 (100.0)	396	81.1

* Numbers in parentheses indicate percentage of column total.
$X^2_{4df} = 8.56$, $p < 0.01$.

socioeconomic status of the patients. The lack of direct association, however, between social class status and urgency of the condition bringing the patient to the hospital facility has already been demonstrated. Further analyses were carried out in the effort to measure the effect of social class upon other aspects of patients' behavior at the time of an acute medical problem. The three highest social class categories were combined for this analysis because of their relatively small numbers.

Usual Source of Medical Care—The social class distribution of patients having different "usual sources" of medical care indicates, as expected, that the higher the class status the greater the percentage with an established private physician relationship. The converse is true for those who usually depend upon the emergency service; the highest proportion occurring in the lowest social class (Table 8). The 61 per cent of patients in classes I-III who have a regular physician relationship contrasts sharply with the 22 per cent in class V.

Frequency of Use of the Emergency Service—Again as expected, those in the higher social classes used the hospital emergency service less frequently that did patients in lower socioeconomic circumstances. The proportion of patients in classes IV and V increased directly with the frequency of visits during the previous year.

Kind of Help Initially Sought—The proportion of patients in classes I-III who applied first to their private physician for medical help is almost twice that of class IV and V patients. Yet, the majority of even this highest group failed to seek private care at all before coming to the emergency room. Of the 46 patients in social classes I-III who claimed to have a regular private doctor, only 24 initially sought his help (Tables 8 and 9).

Type of Referral—Although all social classes had similar percentages for self-referral (52, 53, and 58 for classes I-III, IV, and V, respectively), the highest class grouping had twice the proportion of professional referrals and half that of lay referrals as did the lowest class patients (Table 10).

Summary of Social Class Analyses—In general, those in the higher social class categories were more likely to have a regular private physician and tended initially to seek his help at time of need more often than those in lower class

status. Nonetheless, a large percentage of patients in all social classes and with all usual sources of medical care came directly to the emergency station without prior medical assistance.

Discussion

Methodology

In general, the methods and materials used for this analysis served their purpose well. While the hectic environment of a busy emergency service is not the ideal setting for meticulous data collection, previous experience with the record system, the patient care procedures and the physical layout made possible the development of a practical research design. The most difficult task was that of scheduling the patient interviews to satisfy the requirements of a rigorous sampling plan on the one hand, and to avoid interference with the flow of patient care on the other. The interview system proved, nonetheless, to be effective in reaching all designated patients and in providing most of the desired personal and medical information. Some ambiguity was noted during the coding process regarding those responses dealing with relationship with a private physician and reasons for using the emergency facility.

Two important methodological problems were experienced. It was difficult to standardize the interpretation of criteria for rating of medical urgency among many different physicians. Also, the suitability of the occupation-education index of social class is questionable in this setting and for this population group. Social class categories, for example, did not "fit" closely with family income distribution. Further analysis of the complex interrelationship between socioeconomic and medical care data in respect to this kind of research will be presented in a separate report.

The use of a two-week summer period for the sampling of emergency service experience produced definite biases and limitations in the data. It is recognized that seasonal variations are significant in this setting.[1] In addition, summer vacation patterns may well influence the availability of private physicians and the in-town location of higher income families. The fact that a relatively short sampling period may select a disproportionate number of frequent users of

Table 10—Social class by type of referral to emergency service; interviewed subsample

Type of Referral	Social Class I-III	IV	V	Total	Per cent IV+V
Self	39 (52.0)*	77 (53.1)	102 (58.0)	218	82.1
Employer, police, friend, neighbor, community agency	10 (13.3)	40 (27.6)	46 (26.1)	96	89.6
Private physician, hospital, clinic, private pharmacist	26 (34.7)	28 (19.3)	28 (15.9)	82	68.3
Total	75 (100.0)	145 (100.0)	176 (100.0)	396	81.1

* Numbers in parentheses indicate percentage of column total.

$X^2_{4df} = 16.91$, $p < 0.01$.

the facility is also appreciated. The July sample was retained with these problems in mind, however, since comparisons with data previously collected in other seasons showed similar distributions with respect to demographic and medical characteristics of patients.[1,2] Moreover, the summer period is actually the time of highest patient-load totals in the emergency service.[1,5,7]

Findings

While the data support many of the original hypotheses, some distinct surprises emerged. The demographic profile of the emergency service patient population confirms earlier suppositions with respect to age, sex, color, marital status, city location, and socioeconomic position. That the emergency service patients, in comparison with the general population, did not have shorter tenure of residence and did not have less education was unexpected. In general, however, the findings warrant the conclusion that the ambulatory care facilities of the urban general hospital constitute a major medical care resource for the economically deprived, "core city," minority population groups. These findings are similar in general to those reported in other studies.[4-6]

The sources of "usual" medical care, as reported by this obviously nonrepresentative community sample, reflect a pattern which is far from ideal, in terms of either personal physician's care or use of emergency service facilities. The findings quite clearly indicate the extent to which the hospital emergency facility serves as a "backstop" for the incomplete medical care system outside its walls, as well as an ever-ready resource for the actual medical crises which need immediate and expert attention.

Little more than one-third of the study sample reported having a regular relationship with a personal physician. For an almost equal number the emergency station itself was cited as medical "home-base." The proportion having a regular physician was, as expected, considerably higher among the upper social class groupings and among those who use the emergency service only for urgent medical problems.

Overall, more persons claimed than used a personal physician. The actual percentage of persons in even the highest socioeconomic categories who bypassed their "regular" physician and went directly to the emergency room for care of nonurgent conditions is surprisingly large. About two-thirds of all sampled patients arrived at the hospital emergency station without benefit of prior professional advice, and self- or lay-referral was the observed pattern for a majority of patients in all social class categories. Not unexpectedly, the proportion of nonurgent cases was significantly higher among the lay referrals than among those medically referred. Difficulty or delay in securing private care bolsters this pattern of emergency service usage among all classes and for all levels of "urgency" of medical need. A recent British report[8] indicates a surprisingly similar pattern, despite the availability of prepaid general practitioner services in that country.

With respect to the three factors originally believed to have the greatest effect upon the urgency of need for emergency room treatment, only one was fully substantiated. The primary importance of an ongoing relationship with a personal physician was demonstrated in a number of interlocking associations. The influence of residential tenure was seen to be complex, in that length of time in the area was less important than stability in a particular domicile. The most surprising finding, however, was that the expected social class differences in urgency of use of the hospital service did not appear. Social class status did emerge as a major determinant of utilization of private medical care, suggesting that the socioeconomic factor acts

indirectly through its influence on the doctor-patient relationship rather than directly in relation to use of the emergency room for nonurgent conditions. Earlier studies in this hospital[13] and in Boston,[5] however, have reported a direct association between socioeconomic status and urgency of the patient's condition.

The demographic factors included in the initial hypothesis were also only partly validated by the findings of this study. While the initial expectation was that middle-aged (and presumably busy) adults would have the lowest nonurgency ratings, the opposite proved to be true. Although women were expected to have higher rates of nonurgency, no significant differences in sex distribution appeared. Particularly at odds with initial expectations is the fact that urgency ratings were essentially similar for the various days of the week and the hours of the day—with almost half of all cases seen in the emergency room between midnight and 8 a.m. still rated as nonurgent!

Striking, too, was the total lack of association between the physician's urgency evaluation and the report of duration of the disorder on the part of the patient. This observation poses many questions about the difference in professional and lay concepts of medical need.[14]

Conclusions

In the seemingly inexorable transformation of hospital to community medical center, the emergency service now plays a most significant role. It is at once a basic source of medical care for the economically depressed inner-city population and the back-up resource for the self-supporting community when private care is unavailable. As a window to the unsolved problems of health service for a growing and mobile population, the hospital emergency unit provides an observation post of great usefulness.

The population using the emergency facility can be contrasted with the general population as young, male, nonmarried, central urban, and relatively poor. The patient group tends to rely more on the ambulatory services of the hospital than on the private practice apparatus of the community for its basic medical care, although this pattern has distinct social class variations. At times of perceived crisis, the majority of persons of all classes who use the emergency service tend to go there directly without medical referral—with differences observed according to the presence or absence of an established relationship with a private physician.

The increasing tendency of patients to use the emergency unit for nonurgent conditions is recognized as a response to the problem of obtaining prompt medical care in the community. This, in turn, is due both to the economic and informational barriers faced by the urban poor and to the relatively inflexible structure of modern specialized medical practice. Specific factors affecting the proportion of urgent versus nonurgent cases in the emergency service are—in addition to the crucial influence of prior relationship with a personal physician—age, residential stability, minority group status, and geographical proximity to the centrally located hospital. While indexes of social position are not significantly associated with urgency evaluations, they are powerful determinants of patterns of both usual and emergency medical care.

Although these findings clearly indicate the importance of improved emergency services in community hospitals and the value of some method of initial "triage" of incoming patients, the primary problem lies beyond the hospital walls. The need most pressing is for a community system of medical care which will make personal, continuous, and comprehensive health service available to all classes and all groupings

in the population. Only then can the hospital emergency service take its appropriate place in the spectrum of medical care.

Summary

Methods and findings are reported of a study of 2,028 consecutive visits to the emergency service of the Yale-New Haven Hospital during a two-week period in July, 1964.

Selected demographic and service data were transcribed from the medical records of the full study population, with additional information on socioeconomic status and patterns of medical care obtained from interview-questionnaires conducted on a randomized 20 per cent subsample of 402 patients.

The study group was compared with the general area population, using census and special survey data, in order to define the salient characteristics of those using the emergency service.

Aspects of prior and current patterns of medical care were analyzed in relation to the urgency of need for emergency treatment and to indexes of socioeconomic status, in the effort to identify the major determinants of use of the hospital emergency facility.

Previous hypotheses regarding both the characteristics of those who come to the emergency service and the significant factors determining its use were modified in important respects as a result of the findings of this research.

The emergency unit is demonstrated to be a highly useful laboratory for study of the medical care patterns and problems of the community at large.

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